



Allen-Bradley

by ROCKWELL AUTOMATION

Introducing the ControlLogix[®] 5590 controller



Enable scalable, secure and high- performance control with ControlLogix 5590 controllers

Pressure in industrial operations isn't a secret. It's a design constraint.

Machine designers face the challenge of building highly efficient machines faster. Plant managers and control engineers must balance maintaining legacy systems while planning for the future. System integrators and project engineers are pushed to deliver scalable, secure solutions under tight deadlines.

These aren't just technical challenges. They're human ones.

As systems grow more complex, the challenge isn't just keeping pace — it's staying ahead of the curve without compromising reliability and safety. Fragmented control systems often mean working in silos, with safety, motion and process each operating in isolation. Unscalable control systems force expensive, disruptive upgrades, often leading to wasted engineering time and inconsistent performance across disparate machine generations. And when one of those systems malfunctions, it goes beyond technical issues. It's hours of troubleshooting, delayed production and mounting pressure.

How the ControlLogix 5590 controller simplifies industrial complexity


The ControlLogix 5590 controller helps provide you with control by unifying all control disciplines – discrete, process, motion, robotics, safety and batch – into one scalable, high-performance platform. For engineers that means less time switching between hardware platforms or different product suppliers, fewer integration headaches leaving more time to solve problems that matter.. It is designed to support high-performance applications with expanded memory, advanced motion capabilities and built-in safety across all variants.

The ControlLogix 5590 controller can help you:

Power larger systems with performance, larger memory capacity and support for a greater number of devices.

Unify & simplify system design with built-in functional safety across all controller variants.

Modernize without disruption and engineer more effectively with software and tools that fit your existing infrastructure.

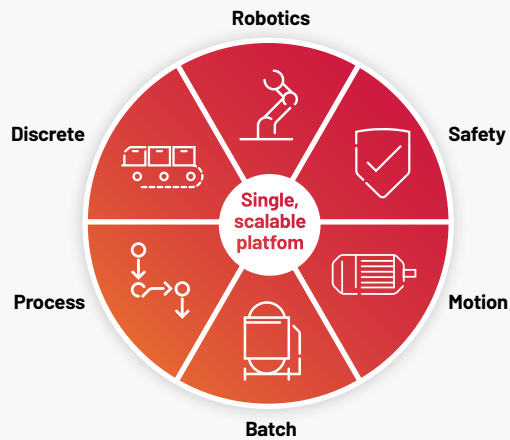


**Reduce downtime,
scale efficiently and
adapt to evolving
needs – all while
lowering your total
cost of ownership.**

Control redefined

The ControlLogix 5590 controller supports diverse and increasingly complex applications. It offers expanded performance capabilities that complement existing systems, particularly in scenarios where higher processing power is required. With fewer catalog numbers and extended capabilities across variations, it helps enable the consolidation of workloads that may have previously required multiple controllers.

This helps you simplify deployment and operations while maintaining compatibility with existing hardware investments.



ControlLogix 5590 controller

DRIVE PLANT-WIDE PERFORMANCE

- Increased motion axis support
- Scalable OPC UA connectivity
- Improved crossloading
- Expanded memory

INTEGRATED SAFETY

- SIL 2/PLd safety capability
- Unified safety and process control

BUILT-IN SECURITY

- Cybersecurity features
- Compliant to IEC 62443-4-2
- Enables Zero Trust architectures

MODERNIZED DESIGN






- XT controller available for harsh environments
- 1 GB Ethernet ports



Driving plant-wide results through high-performance control

With rising system complexity, high-performance control platforms are critical for managing demanding operations while enabling future growth and system expansion.

The ControlLogix 5590 controller helps consolidate disparate systems by supporting the integration of multiple controllers into an Integrated Architecture® platform. The controller maintains compatibility with existing infrastructure while offering the performance needed to break down silos and manage the most complex automation challenges:

-  **High-speed processing** for real-time responsiveness.
-  **Expanded memory options** to support large-scale applications.
-  **Enhanced communication support** for EtherNet/IP and OPC UA nodes.
-  **Advanced motion control** for high axis count systems.
-  **Redundancy performance** with dual 1 GB Ethernet ports for faster crossloading.

Advanced motion control

The ControlLogix 5590 controller delivers motion control performance, supporting up to 512 real and virtual axes for high-speed, coordinated motion across complex applications. This allows you to reduce the number of controllers needed for an application.

With faster scan times and up to 80 MB of memory, it helps enable the execution of demanding motion profiles, making it ideal for robotics, packaging and multi-axis systems.

High availability systems

Redundancy is built into the ControlLogix 5590 controller architecture to support high availability and fault tolerance. The ControlLogix 5590 controller supports controller redundancy, network redundancy and redundant I/O, enabling seamless switchover in the event of a fault. The ControlLogix 5590 controller provides better performance in process-intensive environments providing the required resiliency on all levels.

ControlLogix 5590 controller anatomy

Catalog Number

Access Door

Integrated Display and Status LEDs

Reset/Factory Default

Mode Switch

QR Code and Digital Product Passport

Removable SD Card

USB-C

Dual Gigabit Ethernet ports

DRIVE PLANT-WIDE PERFORMANCE

MORE PRODUCTIVITY, LESS RISK

ACCELERATE INNOVATION, GAIN GREATER INSIGHTS

Drive plant-wide
performance
PG 5

More productivity,
less risk
PG 8

Flexible deployment,
built to scale
PG 9

Accelerate innovation,
gain greater insights
PG 10

Product selection /
architecture options
PG 11

Expanded connectivity

Leverage dual 1GB Ethernet front ports to connect to more devices than before.

The ControlLogix 5590 controller offers enhanced communication support and expanded connectivity capabilities, including support for up to 600 EtherNet/IP nodes and up to 100,000 OPC UA nodes. It features multiple port configurations – such as Device Level Ring (DLR), linear and dual IP configurations – to accommodate diverse network architectures. This flexibility enables users to design robust and scalable systems. Leverage the power of the Logix Designer application Add-On Profiles (AOPs), fostering easy user experience.

The result? The expanded Ethernet connectivity helps to optimize performance and streamline operations across the enterprise. This allows larger systems to support real-time information flow.

This expanded connectivity is the gateway to enterprise-wide operational insight. The platform allows you to seamlessly integrate information from both Rockwell Automation and third-party devices, consolidating diverse data streams into a single control environment. When Rockwell Automation assets connect to Logix, they automatically deliver rich data and diagnostic information without custom programming – a capability Rockwell Automation coins as Premier Integration. This immediate, contextualized information flow confirms that operators and maintenance teams are automatically aware of potential issues, enabling predictive maintenance actions and maximizing uptime. This convergence of control and information turns raw data into actionable intelligence for the operator's direct benefit.



Simplified safety and security that helps enhance productivity

Meeting global safety and security standards while maintaining productivity is no longer optional. The ControlLogix 5590 controller is designed with safety and security built in, not bolted on. Every controller ships with SIL 2/PLd functional safety capabilities built in, enabling simplified deployment in both process and machine safety applications. This helps reduce engineering time, supports compliance with evolving regulations and helps mitigate risks tied to aging infrastructure and workforce constraints.

Unified process and safety control – simplify without compromise

The ControlLogix 5590 controller brings process and safety together in a single controller, enabling you to do more with fewer devices. This unified approach reduces system complexity and hardware footprint while maintaining high performance, reliability, and compliance. Whether you're designing standard process control or safety instrumented systems (SIS), the ControlLogix 5590 controller delivers seamless integration without sacrificing speed, scalability or functionality.



**Built in SIL 2/PLd
on all variants**

Streamlined portfolio, unified control – simplifying automation at every level

The ControlLogix 5590 controller helps simplify controller selection with three versatile options, all including built-in SIL 2/PLd safety capability. This streamlined approach reduces complexity and achieves consistent, high-performance control across a range of environments. The ControlLogix 5590 controller is made for general-purpose applications to extreme conditions and demanding process systems. By unifying process and safety into a single controller, the ControlLogix 5590 controller enables minimizing hardware footprint while supporting reliable, scalable performance for both basic process control and safety instrumented systems (SIS). It's a smarter, more efficient way to design and deploy modern automation solutions.

More secure by design – engineered for evolving demands

The ControlLogix 5590 platform is built to meet the evolving demands of modern industrial environments, where security, connectivity and resilience are more critical than ever. With IEC 62443-4-2 compliance and alignment to Zero Trust principles, it delivers robust protection against emerging threats. CIP Security delivers secure communication across your industrial network, helping you modernize confidently without sacrificing productivity. Whether you're upgrading legacy systems or designing future systems, the ControlLogix 5590 controller provides a more secure foundation for innovation.

Built-in confidence: Security that scales

IEC 62443-4-2 compliance means that the controller is designed with cybersecurity at its foundation. As the brain of your automation system, it gives you a secure starting point to build resilient, connected operations.

Third-party validated

As with most product level certifications globally recognized regulatory bodies help confirm that the product complies and when integrated into a system will meet global standards and not just a product level benchmark.



* FactoryTalk Design Studio software will support the ControlLogix 5590 Standard and XT (corrosion-resistant) controllers upon release of version 2.03 in November 2025. Support for the P (Process) variant will follow in a future version of FactoryTalk Design Studio.

Drive plant-wide performance
PG 5

More productivity, less risk
PG 8

Flexible deployment, built to scale
PG 9

Accelerate innovation, gain greater insights
PG 10

Product selection / architecture options
PG 11

Help accelerate innovation with an efficient, connected ecosystem

In today's fast-paced industrial landscape, speed and agility in developing, deploying and scaling complex applications are key competitive advantages – and the ControlLogix 5590 controller, paired with the FactoryTalk® ecosystem, helps empower teams to deliver faster. Advanced tools and a modern development environment streamline engineering workflows and reduce integration overhead, enabling rapid deployment of sophisticated systems. This approach supports flexible architectures and broad applicability across disciplines, helping users accelerate innovation, gain deeper operational insights and drive performance with confidence.

Core productivity tools

Rockwell Automation bolsters foundational tools make it easier to design, deploy and maintain control systems:

Studio 5000® Logix Designer is the premier on-premise design software for Logix controllers, with feature-rich, multidiscipline support and more hardware compatibility for an integrated Rockwell Automation product experience.

FactoryTalk® Design Studio™ software is a cloud-based design environment that enables users to efficiently create, program and manage projects for ControlLogix® and CompactLogix® controllers, supporting multi-user collaboration and multi-controller project development with integrated version control and modern automation tools.

FactoryTalk® Logix Echo software allows for emulation and simulation of control systems before hardware is available – minimizing risk and enabling early validation.

Emulate3D® digital twin support enables predictive modeling and performance optimization, helping teams simulate and refine systems before deployment.



ControlLogix 5590 Controller

Controller catalog	Description	Network Support				I/O Support	Safety		Security		Process			High Availability
		Ethernet	Use of embedded Ethernet port	ControlNet / DeviceNet / DHRIO	OPC UA ***	Existing I/O*	Logix SIS	Simplex Safety	CIP security**	62443-4-2 compliant	Embedded process objects	Sequence Manager™ software***	Default Process Tasking model	Supports a redundancy configuration ****
1756-L9xxTS	Standard/safety controller	●	●	●	●	●	●	●	●	●	●	●	●	●
1756-L9xxTSXT	Standard/safety harsh environment	●	●	●	●	●	●	●	●	●	●	●	●	●
1756-L9xxTPSXT	Process controller with safety (with harsh environment protection)	●	●	●	●	●	●	●	●	●	●	●	●	●

- Supported in all configurations
- Supported in standard (but not redundant) configuration
- Not Supported

* The embedded ethernet ports can only be utilized for crossloading date when in a redundancy or Logix SIS configuration
 ** ControlLogix 5590 controllers will support the same I/O as the ControlLogix 5580 controller
 *** Not supported in redundancy

5590: 1756-L9 controller catalog definition

1756	L	n	nn	n	nn	nn
Bulletin #	L=Controller	6=5560 7=5570 8=5580 9=5590	02=02MB	T=EtherNet Twisted Pair	S=SI2 Safety PS=PlantPAX + SIL2 Safety	Blank= Unrated XT= Harsh/XT Corrosion







Lead with scalable, secure control

The ControlLogix 5590 controller platform is more than a controller — it's a foundation for building an effective, safer and more connected industrial system. Whether you're scaling across lines or integrating with enterprise systems, the ControlLogix 5590 controller delivers the performance and flexibility to help you lead with confidence. Let's build the future of automation — together.

Learn more about the ControlLogix 5590 controller at:
rok.auto/controllogix-5590



Connect with us.    

rockwellautomation.com — expanding **human possibility**[®]

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